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February 18, 2004

CERTIFICATE OF MAILING
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I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as First Class Mail in an envelope addressed to: MS DD, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date below:

February 18, 2004 — Date
Robert E. Hanson

MS DD
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

RE: *U.S. Patent Application No. 10/620,278 entitled "COMBINATORIAL PROTEIN LIBRARY SCREENING BY PERIPLASMIC EXPRESSION" – Barrett R. Harvey et al.*
Our reference: UTXB:715US

Sir:

Enclosed for filing in the above-referenced patent application is an Information Disclosure Statement, Form PTO-1449, and references A1-A6 and C1-C69.

No fees are believed to be due in connection with the filing of this Information Disclosure Statement, however, should any fees under 37 C.F.R. §§ 1.16 to 1.21 be deemed necessary for any reason relating to the enclosed materials, the Commissioner is authorized to deduct the appropriate fees from Fulbright & Jaworski Deposit Account No.: 50-1212/UTXB:715US.

Please date stamp and return the enclosed postcard evidencing receipt of these materials.

Respectfully submitted,

Robert E. Hanson
Reg. No. 42,628

REH/kmv
Encl.: as noted

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Barrett R. Harvey *et al.*	Group Art Unit: 1645
Serial No.: 10/620,278	Examiner: Unknown
Filed: July 15, 2003	Atty. Dkt. No.: UTXB:715US
For: COMBINATORIAL PROTEIN LIBRARY SCREENING BY PERIPLASMIC EXPRESSION	

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Robert E. Hanson

INFORMATION DISCLOSURE STATEMENT

MS DD
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

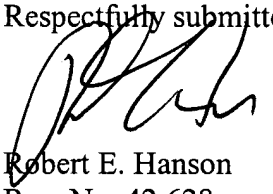
In compliance with the duty of disclosure under 37 C.F.R. § 1.56, it is respectfully requested that this Information Disclosure Statement be entered and the documents listed on attached Form PTO-1449 be considered by the Examiner and made of record. Copies of the listed documents required by 37 C.F.R. § 1.98(a)(2) are enclosed for the convenience of the Examiner. This application is a continuation-in-part application of Serial No. 09/699,023, filed October 27, 2000 and is relied upon for an earlier filing date under 35 U.S.C. § 120.

In accordance with 37 C.F.R §§ 1.97(g), (h), this Information Disclosure Statement is not to be construed as a representation that a search has been made, and is not to be construed to be an admission that the information cited is, or is considered to be, material to patentability as defined in 37 C.F.R. § 1.56(b).

The present Information Disclosure Statement is being filed prior to the receipt of a first Official Action reflecting an examination on the merits, and hence is believed to be timely filed in accordance with 37 C.F.R § 1.97(b). No fees are believed to be due in connection with the filing of this Information Disclosure Statement, however, should any fees under 37 C.F.R. §§ 1.16 to 1.21 be deemed necessary for any reason relating to these materials, the Commissioner is authorized to deduct the appropriate fees from Fulbright & Jaworski Deposit Account No.: 50-1212/UTXB:715US.

Applicants respectfully request that the listed documents be made of record in the present case.

Respectfully submitted,



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Date: February 18, 2004

Form PTO-1449 (modified)	Atty. Docket No. UTXB:715US	Serial No. 10/620,278
List of Patents and Publications for Applicant's INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)	Applicant Barrett R. Harvey *et al.*	
	Filing Date: July 15, 2003	Group: 1645

U.S. Patent Documents	Foreign Patent Documents	Other Art
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U.S. Patent Documents

Exam. Init.	Ref. Des.	Document Number	Date	Name	Class	Sub Class	Filing Date of App.
	A1	5,233,409	8/03/93	Schwab	356	402	2/25/92
	A2	5,571,698	11/05/96	Ladner *et al.*	435	69.7	6/18/93
	A3	5,780,279	7/14/98	Mathews *et al.*	435	172.3	4/05/95
	A4	5,824,520	10/20/98	Mulligan-Kehoe	435	91.41	7/19/97
	A5	5,837,500	11/17/98	Ladner *et al.*	435	69.7	4/03/95
	A6	5,922,545	7/13/99	Mattheakis and Dower	435	6	7/29/97

Foreign Patent Documents

Exam. Init.	Ref. Des.	Document Number	Date	Country	Class	Sub Class	Translation Yes/No

Other Art (Including Author, Title, Date Pertinent Pages, Etc.)

Exam. Init.	Ref. Des.	Citation
	C1	Boder *et al.*, "Directed evolution of antibody fragments with monovalent femtomolar antigen-binding affinity," *Proc. Natl. Acad. Sci. USA*, 97(20):10701-10705, 2000.
	C2	Burioni *et al.*, "A new supbraction technique for molecular cloning or rare antiviral antibody specificities from phage display libraries," *Res. Virol.*, 149:327-330, 1998.
	C3	Burman *et al.*, *J. Bacteriol.*, "Murein and the outer penetration barrier of escheriachia coli K-12, proteus mirabilis, and pseudomonas aeruginosa," Journal of Bacteriology, 112(3):1364-1374, 1972.
	C4	Chen *et al.*, "Selection and analysis of an optimized anti-VEGF antibody: crystal structure of an affinity-matured Fab in complex with antigen," *J. Mol. Biol.*, 293:865, 1999.
	C5	Chen *et al.*, *Nat. Biotechnol.*, "Isolation of high-affinity ligand-binding proteins by periplasmic expression with cytometric screening (PECS)," 19(6):537-542, 2001.

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Other Art (Including Author, Title, Date Pertinent Pages, Etc.)

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	C6	Chen *et al.*, "In vitro scanning saturation mutagenesis of all the specificity determining residues in an antibody binding site," *Protein Eng.*, 12(4):349-356, 1999.
	C7	Chowdhury and Pastan, "Improving antibody baffinity by mimicking somatic hypermutation in vitro," *Nat. Biotech.*, 17:568, 1999.
	C8	Coia *et al.*, "Use of mutator cells as a means for increasing production levels of a recobinant antibody directed against Hepititis B," *Gene*, 201:203, 1997.
	C9	Corey *et al.*, "Trypsin display on the surface of bacteriophage," *Gene*, 128:129, 1993.
	C10	Dall'Aqua and Carter, "Antibody engineering," *Curr. Opin. Struct. Biol.*, 8:443, 1998.
	C11	Daugherty *et al.*, "Flow cytometric screening of cell-based libraries," *J. Immunol. Methods*, 243:211, 2000.
	C12	Daugherty *et al.*, "Quantitative analysis of the effect of the mutation frequency on the affinity maturation of single chain Fv antibodies," *Proc. Natl. Acd. Sci. USA*, 97:2029-2034, 2000.
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	C14	de Haard *et al.*, "A large non-immunized human fab fragment phage library that permits rapid isolation and kinetic analysis of high affinity antibodies," *J. Biol. Chem.*, 274:18218, 1999.
	C15	De Haard *et al.*, "Creating and engineering human antibodies for immunotherapy," *Advanced Drug Delivery Reviews*, 31:5-31, 1998.
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	C19	deWilt *et al.*, "Antibody arrays for high-throughput acreening of antibody-antigen interactions," *Nat. Biotechnol.*, 18:989, 2000.
	C20	Dueñas and Borrebaeck, "Clonal selection and amplification of phage displayed antibodies by linking antigen recognition and phage recognition," *Biotechnology*, 12:999, 1994.

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	C21	Georgiou *et al.*, "Display of heterologous proteins on the surface of microorganisms: from the screening of combinatorial libraries to live recombinant vaccines," *Nat. Biotechnol.*, 15:29-34, 1997.
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	C23	Giep *et al.*, "pSKAP/S: an expression vector for the production of single-chain Fv alkaline phosphatase fusion proteins," *Prot. Exp. Purif.*, 16:63-69, 1999.
	C24	Griffiths *et al.*, "Isolation of high affinity human antibodies directly from large synthetic repertoires," *EMBO J.*, 13:3245-3260, 1994.
	C25	Hawkins *et al.*, "Selection of phage antibodies by binding affinity mimicking affinity maturation," *J. Mol. Biol.*, 226:889-896, 1992.
	C26	Hayhurst and Georgiou, "High-throughput antibody isolation," *Curr. Opin. Chem. Biol.*, 5:683-689, 2001.
	C27	Hayhurst *et al.*, "Isolation and expression of recombinant antibody fragments to the biological warfare pathogen brucella melitensis," *J. Immunol. Methods*, 276:185-196, 2003
	C28	Hayhurst, "Improved expression characteristics of single-chain Fv fragments when dowstream of the Escherichia coli maltose-binding protein or upstream of a single immunoglobulin-constant domain," *Protein Expr. Purif.*, 18:1-10, 2000.
	C29	Hoess, *Chem. Rev.*, "Protein design and phage display," 101:3205-3218, 2001.
	C30	Hoichen *et al.*, *Applied and Environmental Microbiology*, "Novel bacterial membrane surface display system using cell wall-less L-forms of proteys mirabilis and escherichia coli," 68(2):525-531, 2002.
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	C33	Johns *et al.*, "In vivo selection of sFv from phage display libraries," *J. Immunol. Methods*, 239:137-151, 2000.
	C34	Kjaer *et al.*, "Glycerol diversities phage repertoire selections and lowers non-specific phage absorption," *FEBS Lett.*, 431:448-452, 1998.

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	C36	Krebber *et al.*, "Inclusion of an upstream transcriptional terminator inphage display vectors abolishes backgroud expressiono f toxic fusions with coat protein g3p," *Gene*, 178:71-74, 1996.
	C37	Krebber *et al.*, "Reliable cloning of functional antibody variable domains form hybridomas and spleen cell repertoires employing a reengineered phage display system," *J. Immunol. Methods*, 201:35-55, 1997.
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	C39	Low *et al.*, "Mimicking somatic hypermutation: affinity maturation of antibodies displayed on bacteriophage using a bacterial mutator strain," *J. Mol. Biol.*, 260: 359-368, 1996.
	C40	MacKenzie and To, "The role of valency in the selection of anti-carbohydrate single-chain Fvs from phage display libraries," *J. Immunol. Methods*, 220:39-49, 1998.
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	C43	Malmborg *et al.*, "Selection of binders form phage displayed antibody libraries using the BIAcore biosensor," *J. Immunol. Methods,* 198:51-57, 1996.
	C44	Maynard and Georgiou, "Antibody Engineering," *Annu. Rev. Biomed. Eng.*, 339-76, 2000.
	C45	Maynard *et al.*, "Protection against anthrax toxin by recombinant antibody fragments correlates with antigen affinity," *Nat. Biotechnol.*, 20:597-601, 2002.
	C46	Mingarro *et al.*, "Membrane-protein engineering," *Trends Biotechnol.*, 15:432-437, 1997.
	C47	Miroux and Walker, "Over-production of proteins in Escherichia coli: mutant hosts that allow synthesis of some membrane proteins and globular proteins at high levels," *J. Mol. Biol.*, 260:289-298, 1996.

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	C48	Mutuberria *et al.*, "Model systems to study the parameters determining the success of phage antibody selections on complex antigens," *J. Immunol. Methods*, 231:65-81, 1999.
	C49	Nikaido and Vaara, "Molecular basis of bacterial outer membrane permeability," *Microbiol. Rev.*, 49(1):1-32, 1985.
	C50	Nikaido, "Multidrug efflux pumps of gram-negative bacteria," *Journal of Bacteriology*, 178(20):5853-5859, 1996.
	C51	Oliver, "Periplasm," 88-103, 1996.
	C52	Pini *et al.*, "Design and use of a phage display library," *J. Biol. Chem.*, 273(34):21769, 1998.
	C53	Pugsley, "The complete general secratory pathway in gram-negative bacteria," *Microbiol. Rev.*, 57(1):50-108, 1993.
	C54	Rodi and Makowski, "Phage-display technology-finding a needle in a vast molecular haystack," *Curr. Opin. Biotechnol.*, 10:87-93, 1999.
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	C56	Sblattero and Bradbury, "Exploiting recombination in single bacteria to make large phage antibody libraries," *Nat. Biotechnol.*, 18:75-80, 2000.
	C57	Seydel *et al.*, "Testing the '2+ rule' for lipoprotein sorting in the Escherichia coli cell envelope with a new genetic selection," *Mol. Microbiol.*, 34(4):810-821, 1999.
	C58	Sheets *et al.*, "Efficient construction of a large nonimmune phage antibody library: the production of high-affiity human single-chain antibodies to protien antigens," *Proc. Natl. Acad. Sci. USA*, 95:6157-6162, 1998.
	C59	Shusta *et al.*, "Yeast polypeptide fusion surface display levels predict thermal stability and soluble secreation efficiency," *J. Micro. Biol.*, 292:949-956, 1999.
	C60	Stathopoulos *et al.*, "Characterization of Escherichia coli expressing an Lpp'OmpA(46-159)-PhoA fusion protein localized in the outer membrane," *Appl. Microbiol. Biotechnol.*, 45:112-119, 1996.

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Exam. Init.	Ref. Des.	Citation
	C61	Thompson *et al.*, "Affinity maturation of a high-affinity human monoclonal antibody agaisnt the third hypercvariable loop of human immunodeficiency virus: use of phage display to improve affinity and broaden strain reactivity," *J. Mol.Biol.*, 256:77-88, 1996.
	C62	Vaughan *et al.*, "Human antibodies with sub-nanometer affinites isolated from a large non-immunized phage display library," *Nat. Biotechnol.*, 14:309-314, 1996.
	C63	Wittrup, "The single cell as a microplate well," *Nat. Biotechnol.*, 18:1039-1040, 2000.
	C64	Yakushi *et al.*, "Lethality of the covalent linkage between mislocalized major outer membrane lipoprotein and the poptidoglycan of Escherichia coli," *Journal of Bacteriology*, 179(9):2857, 1997.
	C65	Yakushi *et al.*, "A new ABC transporter mediating the detachment of lipid-modified proteins from membranes," *Nat. Cell. Biol.*, 2:212-218, 2000.
	C66	Yamaguchi, "A single amino acid determinant of the membrane localization of lipoproteins in E. coli," *Cell*, 53(3):423-432, 1988.
	C67	Yu *et al.*, "Lipoprotein-28, a cytoplasmic membrane lipoprotein from Escherichia coli," *J. Biol. Chem.*, 261(5):2284-2288, 1986.
	C68	Co-pending U.S. Patent Application Number 09/699,023 (UTSB:675US), filed on October 27, 2000.
	C69	Co-pending U.S. Patent Application Number 10/620,049 (UTSB:721US), filed on July 15, 2002..

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